

USE OF INFORMATION AND COMMUNICATION TECHNOLOGY TOOLS (ICTs) IN FISHERIES/  
AQUACULTURE EXTENSION SERVICE DELIVERY IN BORGU LOCAL GOVERNMENT AREA  
OF NIGER STATE, NIGERIA

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**ABSTRACT**

The ICT tools have great potential for use in agricultural extension and are increasingly being used without corresponding research into their optimal use. This study was aimed at examining the effectiveness of ICT in creating awareness in fish farming among men and women. Eight governmental institutions participated in the aquaculture awareness programme with a total of 220 participants in which 50% was selected through simple random sampling technique. Results shows that 77% of the participants were men while the majority (41%) were in the age category of 40-49 years. Also, 62% had tertiary education while 46.4% had a household size of 7-9 members. Majority (33%) earned a monthly income range of N20, 001-N50, 000 while 11% earned more than N120, 000. On the level of preparedness to commence fish farming, 15% had stocked their ponds while 32% dug their earthen ponds

**KEY WORDS:** Information, Communication, Technology, Tools, Aquaculture, Delivery

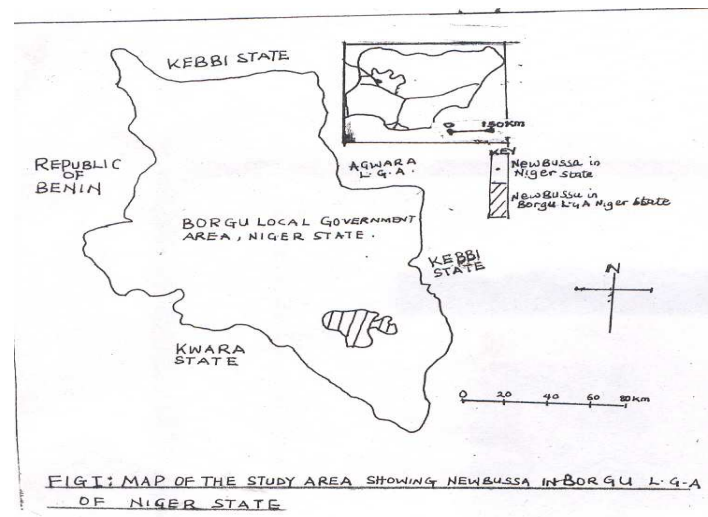
**INTRODUCTION**

Transfer of Technology (TOT) to farmers is one thing, how the farmers are reached is yet another important component of extension. The various methods of reaching farmers (mass media, group methods, individual method, media combinations and use of audio-visual aids, use of folk media and use of modern information communication technologies (ICTs) all have their merits and demerits. Arokoyo (2005) defined ICT as technologies that facilitate communication and the processing and transmission of information by electronic means. The ICT tools that have great potential for use in agricultural extension among others are: radio, television, telephone, camera, video, computer etc. However, Ani (2007) noted that often not included as part of the regular ICTs but very essential in themselves are: printed materials, photographs, question and answer service, group meetings and workshops. In the rural areas, more use is being made of ICT especially the digital camera with video capabilities is becoming very popular because a picture is worth a thousand words and will enable even those constrained by literacy to communicate (Manu, 2003). In the same vein, most FM radios have scored high in popularity and listenership because of their special interest and focus in broadcasting to local audiences in local languages. Access to radio is extensive compared to any other ICT with 4 in 10 persons living in rural areas possessing radio (Oroyokot, 2003). Nonetheless, in the present age of information revolution, the application of ICT in extension delivery is handy to some extent in a developing country like Nigeria. The revolution is an intervention with the potential to ensure that knowledge and information on improved technologies, methods and practices are put into right use by farmers. Information is an important resource in modern agriculture. Gurstein (2003) emphasized that information and communication have become an increasingly powerful tool for improving the delivery of basic services and enhancing local development opportunities. Recent years have seen increases in the use of ICT in almost all spheres of rural life. Ozor (2005) indicated that rural communities require information among others on supply of inputs, innovations, improved technologies, credit, market prices and competitors. On the other hand, Ani (2007) summarized ICT roles in extension as follows: faster access to expert knowledge and information, faster and more efficient delivery of information, more relevant and adapted content and dissemination of information to people hitherto unreached or underserved and a deeper geographic penetration, especially to rural areas.

However, technical development of the ICT devices is increasing much faster than research into their optimal use. This has implications for extension delivery, in that farmers need for information utilization on agricultural improvement is determined for them. Extension delivery itself is entangled in the web of

government bureaucratic redtapism. Private sector participation in extension services is either non existent among the small-scale farmers or minimal among the large-scale farmers in Nigeria.

The main objective of the study was to popularize the activities of the institute both within and without for more awareness that can lead to more fish farming by men, youth and women for increased production for local consumption and export



## METHODOLOGY

### STUDY AREA

Twenty institutions located within the Local Government Headquarters were invited with the option of either coming to the research institute or being met in their own organization. Eight organizations responded immediately. Their choices of training venues were obliged to. There were one hundred and fifty eight people that indicated interest to participate. In view of the number of participants the enlightenment was spread for effective coverage. The first, second and third batches had twenty eight, forty six and sixty eight participants respectively. A week later, four communities jointly sent a letter of request to be enlightened in fish farming. The request was granted and a central venue was fixed at Monai village Model Primary School with sixty participants in attendance. In the whole exercise, a total number of two hundred and twenty participants benefited.

The fisheries extension messages covered in the enlightenment/sensitization were: Fish farming and its potentials, needs for fish farming, types of fish farms, requirements for fish farming, water sources and their disadvantages, characteristics of good culture pond and financing fish farm. The ICTs used for the programme were: Digital camera, Video camera, Computer and its accessories and visual aids that showed pictures of: Types of fish ponds/culture systems, types of culturable fish species, demonstration of results of fish harvest in a fish farm.

This was followed by a questionnaire on assessment of the effectiveness of the device, mode of presentation and the participants' interest and willingness to commence fish farming. This study is a follow-up to ascertain the claims of the participants with regards to their interest to commence fish farming.

Borgu lies between Latitudes 9°N and 11° N and Longitude 2°E and 4°E (Musa, 1972). It is bounded to the North by Kebbi State, to the South by Kaiama and Baruten Local Government Areas of Kwara State, to the west by Benin Republic and to the East by the River Niger and Magama Local Government Area of Niger State. According to the 2006 National Census report, the population of Borgu L.G.A. was 250,336. The

sex distribution of the population was estimated at Males: 40% and Females 60%. Age distribution was as follows: 0-15 years 25%, 16-59 years 65% and 60 years and above 10% (NPC. 2006). Crops grown include various varieties of rice, beans, groundnuts, tomatoes, guinea corn, maize, yams, melon, potatoes, cassava, sugarcane, okro, and cotton. Tree crops include mango, cashew, guava and shea butter which provide the raw materials for a cottage industry (edible oil) which is entirely in the hands of women (Musa, 1972). Majority of the crops grown in the area are on subsistence basis except cotton. Borgu adds more value to the nation's economy as one of the few Local Governments with lot of Federal Government Institutions and Parastatals. The prides amongst others are: Hydro-Electricity Power Generating Station (PHCN), National Institute for Freshwater Fisheries Research (NIFFR), Federal College of Freshwater Fisheries Technology, (FCFFT), Federal College of Wildlife Management (FCWM), the Nigerian Airforce Advance Air Weapon School, the 221 Light Tank Battalion of the Nigerian Army and a host of colleges. The Kainji Lake National Park, Nigeria's First Game Reserve which is charged with conserving the vast flora and fauna species of the territory and harnessing these into international standard tourist attractions. It is the sheer vastness and variety of these species, coupled with other natural and man-made curiosities, which have so aptly earned Borgu the appellation, "the Pride of Nature" (Agboarumi, (1997). These organizations have attracted a lot of non-indigenes from all parts of the country and beyond as a result of job postings, professional commitments and business pursuits. There is the added advantage of possible irrigated and fish farming operations at Kainji dam draw-down areas and Swashi dam where water is available and abundant all year round (Damisa, and Nze, 2004).

## RESULTS AND DISCUSSION

Table1 shows the scenario of the socio-economic characteristics of the respondents with specific reference to gender, age, educational attainment, marital status and income. Data on gender shows that the majority of the respondents were men (77%) while the women constituted 23% of the total population of the respondents. Despite the fact that women participants were less than half of the men's population it is an indication of better prospect for increased interest of women in fish farming.

On the age distribution of the respondents, majority (41%) were within the age group of 40-49 years, while 29% of them were within the age range of 30-39 years. While the first group are middle age men and women with renewed interest in fish farming as a livelihood source before and after retirement from government service, the latter are agile and responsive group of youths ready to take risk in fish farming for their socio-economic.

In terms of the educational attainment of the respondents, majority (62%) had tertiary education with many graduates and post-graduate degree holders while only 4% had adult literacy. The high literacy level of the respondents is an added advantage since improved educational level tends to facilitate more curiosity and interest in proven aquaculture technology.

Data on the household size shows that majority (46.4%) had a household size of 7-9 people. About 29% had household size of greater than 9 people while only 8.2% had a very small household size of less than 3 people. A careful look at the Table shows that over 75% of the participants had a household size of 7 people and above. This implies that more hands will be available for the characteristic routine nature of fish farming activities in terms of labor need.

On the marital status of the respondents, 84.5% were married while only 3.6% were single. This could also be an added advantage in terms of labor supply for fish farming operations.

Data on monthly income level of the respondents shows that the majority (37%) were within income range of #20,001-#50,000. However, while 22% of the respondents earned a monthly income of less than #20,000, half of this proportion (11%) had a comparatively higher income of greater than #120,000. The importance of this income distribution to fish farming is that each of the income levels is amenable to alternative fish culture systems such as extensive, semi-intensive or intensive fish farming depending on the individual financial capabilities and choice of culture systems. The highest income category have the

financial capability to adopt relatively more expensive culture system such as intensive fish farming while the lower income groups might decide to adopt homestead or semi-intensive culture system.

Table1: Socio-economic characteristics of the respondents

Variables	Frequency	Percentage (%)
Gender		
Men	85	77
Women	25	23
Total	110	100
Age (Years)		
< 30	15	14
30-39	32	29
40-49	45	41
> 50	18	16
Total	110	100
Educational level		
Adult literacy	5	4
Primary	13	12
Secondary	24	22
Tertiary	68	62
Total	110	100
Household size		
< 3	9	8.2
4- 6	18	16.4
7- 9	51	46.4
> 9	32	29
Total	110	100
Marital status		
Single	4	3.6
Married	93	84.5
Widowed	6	5.5
Divorced	7	6.4
Total	110	100
Income level (monthly)		
< #20,000	24	22
#20,001 - #50,000	41	37
#50,001 - #80,000	18	16
#80,001 - #120,000	15	14
> 120,000	12	11
Total	110	100

Table 2: Distribution of respondents in various stages of fish farming

Stages of Preparedness	No of Respondents	Percentage (%)
Interested but for land	38	35
Acquired land	20	18
Dug earthen ponds	35	32
Stocked ponds	17	15
Total	110	100

The different stages of preparedness of the respondents to adopt fish farming are shown in Table 2. While the majority (35%) indicated interest in practicing fish farming but constrained by the wherewithal to acquire land for such purpose, 32% of the respondents had dug earthen ponds of various sizes ranging from 3m by 5m to 30m by 40m preparatory to stocking with fingerlings. Similarly 15% of the respondents had actually stocked their ponds with fingerlings. All the respondents stocked their ponds with catfish, thus practice monoculture system. However; only 18% had acquired land but were yet to prepare such lands to ponds. This result clearly shows the effectiveness of the information and communication technology used in sensitizing the respondents that participated in the programme. This is in tandem with Arokoyo (2005) that a strong linkage complimented by flawless information flow, enhanced by the effective use of ICT by the extension service, will significantly boost agricultural production and improves rural livelihoods in developing countries. In a similar vein, Asian Development Bank (ADB, 2003) maintained that, ICT has become a powerful tool in providing developing countries with unprecedented opportunities to meet vital development goals far more effective than before. It has been shown that ICT had been more effective than other communication methods in agricultural extension in developing countries like Egypt, India, Mexico, Peru, South Africa and Uganda in diffusing information to rural communities

(Munyua, 2000), asserted that the use of ITC methods in many developing countries by clients is constrained by poverty, illiteracy, poor infrastructural facilities and energy. The use of ICTs in extension delivery is still at its low ebb in Nigeria. However, radio and television made tremendous contributions in extension delivery for sustainable development (Ani, 2007). The ICT particularly, the digital camera with computer facilities, questions and answers services, photographs serve two important different functions of improvement in the process of information transfer and strengthening the motivation to change. However, due to the weak research-extension-farmer linkage, the information content is provider- driven instead of user- driven.

A critical problem facing agricultural extension in Nigeria is the insufficient number of agricultural extension workers that provide service to the huge population of farmers. In 1995, Nigeria's Agricultural Development Projects (ADP) was able to cover 7,809, 500 farm families and operated at the ratio of 1:1,189 farm families. In 1997 Nigeria had 6,563 agricultural extension workers with an extension agent/farm family ratio of 1:1,615 (Agbamu 2005). On the other hand, the ratios for Indonesia, Mexico and Tanzania are 1:1,200, 1: 800 and 1: 1,000 respectively. These are in sharp contrast to 1: 252 and 1: 500 found in Japan and South Korea respectively (Agbamu, 1998). He further contended that by the end of 2003, the ratio of agricultural extension agents to farm families in Nigeria was about 1:1,722.

The low awareness level of many farm families in Nigeria could be responsible for the situation where in spite of all the potentials, in artisanal and fish farming Nigeria was placed in the 40<sup>th</sup> position with 30,677 (0.1%) tonnes in the world ranking of top 40 aquaculture producing nations (FAO/IFID, Accessed, 2008). Hence, Nigeria remained the highest fish importer in Africa. Computation by the Federal Department of Fisheries (FDF) 2002) showed that in the last decade (1991-2000) total aquaculture production was 201,707 tonnes of local total fish supply representing 5.3% with an average of 20,171 tonnes per year. Local production is quite low and can not meet up demand. Dada (2004) confirmed that aquaculture potentials of the country have not undergone the degree of development it is to exhibit because less than 1% of the potential is undergoing utilization. In the rural areas, there are pockets of small-scale fish farmers at low levels of intensification and adaptation of the aquaculture innovations and technologies (site selection, pond construction, fertilization, stocking, feeds). The sustainability of fish farming in Nigeria depends on many factors. Chiefly among the factors are, how are the practicing and potential fish farmers reached?, frequency of meeting them, availability of inputs, innovations and technologies.

African development lag significantly behind much of Global south despite decades of assorted development approaches and has been receiving increased attention as the United Nation's Millennium Development Goals (MDGs) which provide the goals for international effort through 2015 (FAO-FIDI, 2003). Fisheries extension in an effort to contribute in the MDG adopted some of the simple ICT tools (video, digital camera, computer, slides) to disseminate fisheries innovations and technologies that place

priority on the livelihood systems and ways in which the rural poor can improve their living conditions. The aims are to: find alternative and or additional employment for a large number of fishermen/women, under/unemployed farmers, youth to increase domestic fish production, achievement of self-sufficiency in fish production., modernization of the means of fish production, processing, storage and marketing , rational exploitation and conservation.

Food security is the biggest challenge not only to Nigeria but to the developing countries of Africa. There are deficits between food supply and demand in view of population explosion. Food security is about the ability of a household head to either possess or be able to provide the required meals per day in a year. However, communities engaged in small-scale fishing or farming are often poor and are in danger of being further disadvantaged as resources degrade or as large –scale operators dominate land and resource use.

#### CONCLUSION

The use of ICT tools in fisheries extension deserve more attention because a picture is worth more than a thousand words and will enable even those constrained by literacy to communicate as its effectiveness is amply demonstrated.

#### RECOMMENDATIONS

It is therefore recommended that:

1. Capacity building on the use of ICT tools is imperative for the fisheries extension staff.
2. The clientele whose interest are being aroused on fish farming equally need some level of training on fish farming management practices.
3. Fingerlings availability should be duly ensured by the institute in order to satisfy the fish seed needs of the fish farmers.

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